

driven fan and means for filtering. The Examiner also states that Nayfa et al. disclose a cleaner having a managing unit with support wheels and a handle. The Examiner believes that it would have been obvious to one of ordinary skill in the art to provide the handle of Nayfa et al. in Kern in order to allow an operator to guide the travel of the cleaner. The Examiner states that Vance discloses a vacuum cleaner with a joint between a foot portion and a managing unit that allows the foot portion to float above a surface and that it would have been obvious to one of ordinary skill in the art to provide the joint of Vance in Kern in view of Nayfa et al. in order to allow the foot portion to smoothly travel over an uneven surface. Applicants respectfully disagree.

Kern discloses a pneumatic street cleaning device. Nayfa et al. discloses a self-propelled floor cleaning machine with a vacuum pickup. Vance discloses a suction cleaner that may be used as an upright cleaner or a canister cleaner. These references, taken in combination or separately, do not teach or suggest Applicants' claimed invention.

Applicants' invention is directed towards a closed loop vacuum cleaner for cleaning a floor surface that includes, among other things, a managing unit containing a handle and support wheels, a foot portion supported by the managing unit and containing an expanded chamber therein, the foot portion further including an intake nozzle and an outlet nozzle directed toward the chamber, the cross section of the outlet nozzle being larger than the cross section of the intake nozzle, thereby increasing the velocity of air at the intake nozzle while decreasing the velocity of air at the outlet nozzle, a motor driven fan for creating air flow, the motor driven fan being supported by one of the foot portion and managing unit and being connected to the intake nozzle and the outlet nozzle to form a closed loop air system with the expanded chamber, means within the closed loop air system for filtering dirt and pollutants from the air within the system,

and a universal joint between the foot portion and the managing unit to thereby allow the foot portion to float above the floor surface being cleaned.

The references relied upon by the Examiner fail to disclose or suggest many of the claimed limitations of Applicants' invention. For example, Kern does not disclose or suggest a closed loop vacuum cleaner system as recited by Applicant. Kern's system is an open loop. It is not closed. Nor does Kern disclose a handle, a foot portion including an intake nozzle and an outlet nozzle directed toward the chamber where the cross section of the outlet nozzle is larger than the cross section of the intake nozzle thereby increasing the velocity of air at the intake nozzle while decreasing the velocity of air at the outlet nozzle, or a universal joint between the foot portion and the managing unit that allows the foot portion to float above the floor surface being cleaned.

Kern does not disclose a handle nor would one be desired in the invention of Kern. Kern is directed to a large machine for cleaning streets, road surfaces, or vast areas such as the floors of factories or mills. The Examiner relies upon the teaching of Nayfa et al. to disclose a handle. However, placing such a handle on the machine disclosed in order to guide the large machine of Kern is rather pointless.

Furthermore, while Kern may disclose intake and outlet nozzles, they do not meet the claimed limitations of the outlet nozzle being larger than the cross section of the intake nozzle and thereby increasing the velocity of air at the intake nozzle while decreasing the velocity of air at the outlet nozzle. Figure 8 of Kern, referenced by the Examiner shows a cross section of only part of the outlet and intake nozzles. A better view is illustrated in Figure 6. It is not clear from that view that the claimed cross sectional relationship between the nozzle 15 and

the nozzle 40 are met.

The Examiner relies upon Vance to disclose a universal joint. Applicants strongly disagree. Vance discloses a hinge or ordinary joint not a universal joint. An ordinary joint gives the handle or managing unit only one degree of movement relative to the foot portion. That is, the managing unit can be tilted back and forward without compromising the contact between the surface being cleaned and the perimeter sealing of the floating foot. If the managing unit of Vance were to tilt in a sidewise direction, the perimeter sealing of the foot portion would lose contact with the surface being cleaned and the returning air stream would escape and go into the surrounding space. Clearly, this would not be a desirable or intended function of the cleaner disclosed in Vance. This is unlike Applicants' recited feature of a universal joint. A universal joint allows for the foot to truly float independently of tilting the handle in a backward, forward, or sidewise direction. Therefore, even if Kern, Nayfa et al. and Vance have been properly combined, Applicants' invention would not result or be rendered obvious.

The Examiner has rejected Claim 5 under 35 U.S.C. §103(a) as being unpatentable over Kern in view of Nayfa et al. and Vance and further in view of the Japanese patent to Matsushita. The Examiner admits that Kern in view of Nayfa et al. and Vance fail to disclose a centrifugal filter but that Matsushita does disclose a cleaner with a centrifugal filter and that it would have been obvious to one of ordinary skill in the art to provide the filter disclosed in Matsushita in the combination of Kern, Nayfa et al., and Vance in order to allow for the most effective filtering of the air. Applicants respectfully disagree.

Applicants' comments regarding Kern, Nayfa et al., and Vance apply to this rejection as well and will not be repeated herein. Matsushita adds little, if anything, to the

teachings of these references. Matsushita does not disclose or suggest any of the features of Applicants' claimed invention that has been found lacking in the references discussed above. Therefore, Applicants' invention as not been disclosed or suggested by the combination of references relied upon by the Examiner.

The Examiner rejected Claims 6 and 9-10 under 35 U.S.C. §103(a) as being unpatentable over the British patent to Nichols in view of Vance. According to the Examiner the British patent to Nichols discloses a vacuum cleaner with a foot portion having an expanded chamber having an intake nozzle and an outlet nozzle, a managing unit, a motor driven fan, and a filtering means but fails to disclose a joint between the foot portion and the managing unit. The Examiner believes that Vance discloses a vacuum cleaner with a joint that allows the foot portion to float above a surface and that it would have been obvious to one of ordinary skill in the art to provide the joint of Vance in Nichols in order to allow the foot portion to smoothly travel over an uneven surface. Applicants respectfully disagree.

Nichols discloses a cleaning device with means for directing a stream of fluid at or over a surface to be cleaned. Vance discloses a suction cleaner that may be used as an upright cleaner or a canister cleaner.

Applicants' claimed invention is directed towards a closed loop vacuum cleaner for cleaning a floor surface that includes, among other things, a foot portion containing an expanded chamber therein, the foot portion further including an intake nozzle and an outlet nozzle directed toward the chamber, a managing unit containing a handle and support wheels, a motor driven fan for creating air flow, the motor driven fan being supported by one of the foot portion and managing unit and being connected to the intake nozzle and the outlet nozzle to form

a closed loop air system with the expanded chamber, means within the closed loop air system for filtering dirt and pollutants from the air within the system, and a universal joint between the foot portion and the managing unit to thereby allow the foot portion to float above the floor surface being cleaned. The expanded chamber is located between the intake nozzle and the outlet nozzle and overlies and is in direct fluid communication with the floor surface being cleaned.

Neither Nichols nor Vance, taken alone or combination, discloses or suggests many of Applicants' claimed features. For example, Nichols does not disclose or suggest an expanded chamber located between the intake nozzle and the outlet nozzle and that overlies and is in direct fluid communication with the floor surface being cleaned. The expanded chamber of Nichols to which the Examiner refers, is located after the returning nozzle and before the intake nozzle and is really located underneath the space of the foot. This is the opposite of Applicants' invention that includes the intake nozzle, the expanded chamber, and then the outlet nozzle. The purpose of placing the expanded chamber before the outlet nozzle is to diminish the velocity of the returned air stream and its specific kinetic energy in order to prevent the air from escaping to the surrounding space through the seal around the perimeter of the floating foot.

Vance adds little, if anything, to the teaching of Nichols. The Examiner relies upon Vance to disclose a universal joint. Applicants strongly disagree. Vance discloses a hinge or ordinary joint not a universal joint. An ordinary joint gives the handle or managing unit only one degree of movement relative to the foot portion. That is, the managing unit can be tilted back and forward without compromising the contact between the surface being cleaned and the perimeter sealing of the floating foot. If the managing unit of Vance were to tilt in a sidewise direction, the perimeter sealing of the foot portion would lose contact with the surface being cleaned and the

returning air stream would escape and go into the surrounding space. Clearly, this would not be a desirable or intended function of the cleaner disclosed in Vance. This is unlike Applicants' recited feature of a universal joint which allows for the foot to truly float independently of tilting the handle in a backward, forward, or sidewise direction. Therefore, even if Nichols and Vance have been properly combined, Applicants' invention would not result or be rendered obvious.

The Examiner has rejected Claim 7 under 35 U.S.C. §103(a) as being unpatentable over the British patent to Nichols in view of Vance and further in view of Kern. According to the Examiner Nichols in view of Vance disclose a cleaner but fail to disclose an outlet nozzle having a cross-section larger than the intake nozzle but that Kern discloses an expanded chamber with an outlet nozzle having a cross-section larger than the intake nozzle and that it would have been obvious to one of ordinary skill in the art to provide the outlet nozzle of Nichols in view of Vance with a larger cross-section as disclosed in Kern in order to prevent blasting of dirt from the surface and allow for rapid removal of dirt from the surface. Applicants respectfully disagree.

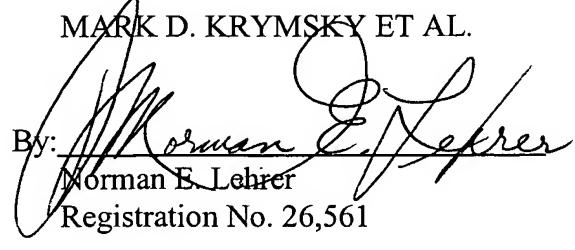
Applicants' comments regarding Nichols and Vance apply to this rejection as well and will not be repeated herein. Kern adds little, if anything, to teachings of Nichols and Vance. Kern may disclose intake and outlet nozzles, however, they do not meet Applicants' claimed limitations of the outlet nozzle being larger than the cross section of the intake nozzle and thereby increasing the velocity of air at the intake nozzle while decreasing the velocity of air at the outlet nozzle. Therefore, the combination of reference relied upon by the Examiner would not result in or render Applicants' claimed invention obvious.

In view of the foregoing, Applicants submit that all of the claims clearly and patentably distinguish over the references of record. It is believed that this application is in condition for allowance and an early action toward that end is most respectfully solicited.

Respectfully submitted,

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